ABSTRACT OF THE DISCLOSURE

A dedicated bandwidth switch backplane has efficient receive processing capable of handling highly parallel traffic. Packets must pass a filtering check and a watermark check before the receive port is allowed to release them to a queue. Highly efficient algorithms are applied to conduct the checks on the packets in a way which expedites receive processing and avoids contention. A hybrid priority/port-based arbitration algorithm is used to sequence filtering checks on pending packets. A watermark comparison algorithm performs preliminary calculations on the current packet using "projected" output queue write addresses for each possible outcome of the queueing decision on the preceding packet and using the actual outcome to select from among preliminary calculations to efficiently address the outcome-dependence of the current packet's watermark check on the queueing decision made on the preceding packet. Receive ports are operatively divided into full-write receive ports and selective-write receive ports for delivering their packets to the output queue. On the clock cycles where the selective-write receive port is assigned writing privileges, data is read from the queue, unless the selective-write receive port has indicated it wishes to write to the queue, in which case the selective-write receive port writes to the queue. The full-write receive ports always write data, if available, to the queue on the clock cycles where they are assigned writing privileges.